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During the fly season, myiasis, or the presence of dipterid larvae in tissues, is a common and troublesome affliction of mammals. One of the most commonly encountered forms of myiasis is cutaneous myiasis, where the larvae occur in the skin. Many genera of flies are associated with cutaneous myiasis, including the awesome primary screwworm (*Callitroga hominivorax*), various blow flies, flesh flies (*Sarcophaga* spp.), and skin bots (*Cuterebra* spp., *Wohlfahrtia* spp.). The amount of damage inflicted on the host varies from slight, as in the case of cuterebriasis, to death, as often is the case with primary screwworm disease. Since most of the larvae look similar, differential diagnosis in the field is difficult.

The purpose of this report is to discuss *Wohlfahrtia* myiasis, based on observations of four cases seen in pups. The cases followed a pattern that can be recognized clinically. Larvae recovered from the pups were identified microscopically as *Wohlfahrtia*. In two instances, larvae were allowed to pupate, and the emerged adults were identified as *W. opaca*.

Clinical Picture

While many animals host *Wohlfahrtia*, the usual ones seen clinically are pups and kittens. Infection may take place within hours after birth, so that well developed larvae in large abscesses may be present in very young pups and kittens. Apparently the skin of older animals resists penetration by the larvae, so the infection characteristically occurs in a youthful host. Infected animals are stunted and listless.

The lesions usually are on the dorsal aspect of the anterior half of the body. There is no history of a pre-existing wound. The lesion is an abscess with a round perforation (breathing pore) about three mm. in diameter in the skin surface. Hair around the pore is matted as a result of seepage of suppurative exudate through the perforation. The pair of spiracular plates on the larva's posterior end can be seen through the pore. Extension and contraction of the larva during feeding cause its posterior end to be moved back and forth through the perforation. The larvae usually remain in muscle and connective tissue and do not penetrate the body cavities. A single larva is present in each abscess. The extent of a large lesion is visible in a radiograph shown in Figure one. The arrow points to a gas pocket at the posterior limit of the lesion. The anterior limit approaches the axilla. The breathing pore is near the anterior limit. Visibility of the lesion was enhanced by an injection of a radio-opaque substance before radiography. The larva dropped from this lesion the next day.

The lesions heal rapidly by granulation after the larvae drop out or are removed manually by forceps. Healing is fostered

by the use of antibiotic dusts and by routine cleansing of the area.

Morphology of the Parasite

Wohlfahrtia are classified among the flesh flies (Sarcophagidae). They are somewhat larger (10–15 mm. long) than a house fly and have a silvery-greyish coloration with black markings on the dorsal abdomen. In *Wohlfahrtia opaca,* these markings resemble tear drops (Figure 2). The larvae resemble most other "maggots" recovered from skin lesions; they measure up to about 20 mm. long (Figure 3). Identification is based on microscopic characteristics of the spiracular plates. These plates are seen grossly as two brown spots set into a deep concavity on the posterior end of the larva.

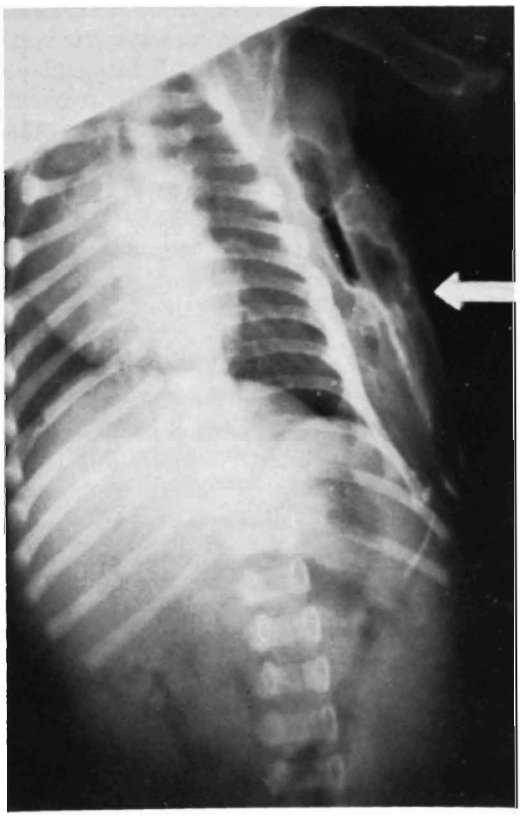

Figure 1. Ventrodorsal radiograph of an 8-week-old pup with a *Wohlfahrtia* larva. The lesion was outlined by the addition of a radio-opaque medium. Arrow indicates posterior limit of lesion. Breathing pore is visible near axilla, at level of elbow.

Life Cycle

Female *Wohlfahrtia* are larviparous and may deposit larvae on healthy, unsoiled, unbroken skin. Females are not attracted to foul wounds. Usually larviposition occurs on the tender skin of young animals such as rabbits, mink kits, kittens, and pups. Several instances of human infection are known. The female hovers over the skin, depositing a few larvae at a time, usually on the dorsal aspect of the host. After deposition, the larvae penetrate the dermis and undergo two molts and considerable growth. During this time, they have maintained a round breathing pore through the epidermis. After about 7–9 days, the larva drops to the ground, buries itself, and pupates. The adult emerges in about three weeks.

Pathogenesis

There are both local and systemic consequences of the presence of larval *Wohlfahrtia.* Locally, an abscess develops as a result of contamination of the larval niche by bacteria from the skin. This abscess may extend to a more generalized cellulitis. It is interesting to note that in spite of the dreadful appearance of the lesion and the activity of the larva within, the host seems unaware of the larva's presence. In the cases we have seen, there has been no licking, rubbing, or scratching of the lesions. However, affected suckling pups fail to maintain the growth rate of their litter mates. They remain stunted as long as the larvae are present. Anemia and neutrophilia with a left shift are associated with the systemic signs. After the larvae are removed, the pups soon achieve a more rapid growth rate, so that in time they may match their unaffected litter mates. Reasons for this stunting are unknown, but it may be due to toxicosis from absorption of larval metabolites.

An unusual infection was seen in a 7-year-old male Pekingese that died from an anesthetic accident. At necropsy, a *Wohlfahrtia* larva was found within the tympanic bulla, with the breathing pore established in the middle ear. Suppurative otitis

Figure 2. Adult *Wohlfahrtia opaca* that was cultivated from an affected pup. Notice the abdominal markings, particularly the characteristic teardrop spots on the third abdominal segment.

Figure 3. Larval *Wohlfahrtia* removed from an 8-week-old pup. These larvae can be differentiated from others found in the skin by microscopic examination of the spiracular plates at the posterior end.

media and perforated tympanum were present. There was no clinical indication that this infection was present. Apparently the larva was deposited in the auditory meatus and was successful in penetrating the tympanum, thus predisposing the middle ear to secondary infection.

Treatment and Control

The presence of the larva in the host is self-limited, since the parasite drops out in about a week. Nevertheless, therapy is indicated when one considers the systemic effects of the infection. Manual removal of each larva by forceps is the method of choice. Since any one host seldom harbors more than three or four larvae, manual removal is not a tedious chore. The use of insecticidal sprays is not recommended, since the larvae may die inside the abscess and complicate the process.

After the larva is removed, the abscess heals rapidly by granulation. Antibiotic dusts, routine cleansing, and symptomatic therapy that is indicated will bring about resolution in about a week. A tiny scar will remain, but this will be too small to be disfiguring. However, it is this scar that makes this parasite so important to mink and fox ranchers.

Control is a matter of keeping suckling pups and kittens in screened enclosures. Most infections occur in farm-reared pups or kittens kept in an unprotected area.

Summary

Cutaneous myiasis caused by *Wohlfahrtia* can be recognized clinically due to its characteristic pattern. Suckling dogs or cats have draining abscesses on the anterodorsal quarter of their bodies. Each abscess contains a single larva, which feeds actively for about a week and then drops to the ground. Infected pups are stunted and listless. Treatment is by manual removal of each larva.